IN THE UNITED STATES PATENT AND TRADEMARK OFFICE BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

In re Application of: Thomas C. Russell et al.	§ §	
	§	Group Art Unit: 2121
Serial No.: 10/601,687	§ §	
Confirmation No.: 7982	§	
	§	Examiner: Tejal Gami
Filed: June 23, 2003	§	

For: METHOD AND APPARATUS FOR SELF-CONFIGURING SUPERVISORY CONTROL AND DATA ACQUISITION (SCADA) SYSTEM FOR DISTRIBUTED CONTROL

CERTIFICATE OF TRANSMISSION

I hereby certify that this correspondence is being electronically transmitted via EFS-Web, on the date shown below:

December 15, 2008	/Joseph Jong/
Date	Joseph Jong

MAIL STOP APPEAL BRIEF - PATENTS
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Sir:

APPEAL BRIEF

Applicants submit this Appeal Brief to the Board of Patent Appeals and Interferences on appeal from the decision of the Examiner of Group Art Unit 2121 dated May 13, 2008, finally rejecting claims 1-10, 12 and 14-23. The final rejection of claims 1-10, 12 and 14-23 is appealed. This Appeal Brief is believed to be timely since it is transmitted by the due date of December 14, 2008, as set by the filing of a Notice of Appeal on October 14, 2008.

The fee of $540.00 for filing this brief is paid herewith via credit card payment. While additional no fees are due, the Commissioner is hereby authorized to charge counsel's Deposit Account No. 20-0782 / 1619.036854 (AIR/0121) / GGM for any fees, including extension of time fees, required to make this brief timely and acceptable to the Office.

TABLE OF CONTENTS

1. Identification Page 1
2. Table of Contents 2
3. Real Party in Interest 3
4. Related Appeals and Interferences 4
5. Status of Claims 5
6. Status of Amendments 6
7. Summary of Claimed Subject Matter 7
8. Grounds of Rejection to be Reviewed on Appeal 9
9. Arguments 10
10. Conclusion 18
11. Claims Appendix 19
12. Evidence Appendix 27
13. Related Proceedings Appendix 28

Real Party in Interest

The present application has been assigned to Air Liquide Electronics U.S. LP, Dallas, Texas.

Related Appeals and Interferences

Applicant asserts that no other appeals or interferences are known to the Applicant, the Applicant's legal representative, or assignee which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

Status of Claims

Claims 1-10, 12 and 14-23 are pending in the application. Claims 1-20 were originally presented in the application. Claims 21-23 were added during prosecution. Claims 11 and 13 have been canceled without prejudice. Claims 1-10, 12 and 14-23 stand finally rejected as discussed below. The final rejections of claims 1-10, 12 and 14-23 are appealed. The pending claims are shown in the attached Claims Appendix.

Status of Amendments

All claim amendments have been entered by the Examiner. No amendments to the claims were proposed after the final rejection.

Summary of Claimed Subject Matter

A. CLAIM 1 – INDEPENDENT

Claim 1 recites in an industrial equipment network for interconnecting a plurality of devices, apparatus for permitting an associated SCADA system to be self-configuring. *See, e.g.*, page 3, lines 8-14.

The apparatus includes a plurality of controllers dedicated to each one of said plurality of devices, respectively, for providing each with control and data functions for interacting with other of the devices in the equipment network, and other systems, wherein each one of said plurality of devices includes device configuration means for creating or updating device configuration data, the device configuration data including description of the device and representation of interconnection and interaction of the device with other ones of said plurality of devices. *See, e.g.*, Figure 2, elements 16, 20, 22 and 24; page 9, lines 5-10; page 6, lines 11-20; Figure 4, step 38; page 10, lines 14-17; Figure 5, step 46; page 11, lines 6-9; page 12, lines 11-14; and page 14, line 3-page 18, line 1.

The apparatus further includes a computer network and means connected between said computer network and said plurality of controllers, respectively, for transferring data and/or control signals between individual ones of said plurality of controllers and said computer network at given times. *See, e.g.*, Figure 2, LAN 2.

The apparatus further includes auto-discovery means for permitting said SCADA system to both self-configure itself relative to devices in said industrial equipment network, and to be updated relative to changes in the configuration of said industrial equipment, and associated devices or equipment therein, including discovering new or changed devices via communication of the device configuration data over said computer network. *See, e.g.*, page 6, lines 11-22; page 7, line 16-page 8, line 2; Figure 4, element 36 and 37; page 10, lines 6-14; Figure 5, elements 44 and 45; page 11, lines 3-7; Figure 6, element 55; and page 12, lines 7-11.

B. CLAIM 7 - INDEPENDENT

Claim 7 recites a method for permitting a Supervisory Control and Data

Acquisition system (SCADA) to automatically diagram the interconnection and interaction, and changes thereto, between a plurality of pieces of industrial equipment and/or a plurality of devices that may be connected to one another and to a data network. *See, e.g.*, page 3, lines 8-14.

The method includes configuring said plurality of pieces of industrial equipment and/or devices using a configuration tool included in each of said plurality of pieces of industrial equipment and/or devices, the configuration tool creating or updating device configuration data including description of the piece of industrial equipment and/or device and representation of the interconnection and interaction thereof with other ones of said plurality of pieces of industrial equipment and/or devices. *See, e.g.*, Figure 2, elements 16, 20, 22 and 24; page 9, lines 5-10; page 6, lines 11-20; Figure 4, step 38; page 10, lines 14-17; Figure 5, step 46; page 11, lines 6-9; page 12, lines 11-14; and page 14, line 3-page 18, line 1.

The method further includes establishing a network over which said plurality of pieces of industrial equipment and/or devices can selectively communicate with one another and with a SCADA system. *See, e.g.*, Figure 2, LAN 2.

The method further includes connecting different ones of said plurality of pieces of industrial equipment and/or devices each to either a common controller, or each to individual dedicated controllers, respectively, or each to a plurality of controllers, or some combination thereof. *See, e.g.*, Figure 2, LAN 2.

The method further includes programming each controller for controlling and identifying its associated piece of industrial equipment and or device, and for sending the device configuration data both to the other ones of said plurality of pieces of industrial equipment and/or devices, and to said SCADA system over said data network. *See, e.g.*, page 6, lines 11-22; page 7, line 16-page 8, line 2; Figure 4, element 36 and 37; page 10, lines 6-14; Figure 5, elements 44 and 45; page 11, lines 3-7; Figure 6, element 55; and page 12, lines 7-11.

Grounds of Rejection to be Reviewed on Appeal

Rejection of claims 1-10, 12 and 14-23 under 35 U.S.C. 102(b) as being anticipated by *Niemela et al*. ("Embedded middleware: State of the art" VTT Electronics, Technical Research Centre of Finland, ESPOO 1999; hereinafter "*Niemela*").

ARGUMENTS

1. Rejection of claims 1-10, 12 and 14-23 under 35 U.S.C. 102(b) as being anticipated by *Niemela.*

The Applicable Law

"A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference." *Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987). "The identical invention must be shown in as complete detail as is contained in the ... claim." *Richardson v. Suzuki Motor Co.*, 868 F.2d 1226, 1236, 9 USPQ2d 1913, 1920 (Fed. Cir. 1989). The elements must be arranged as required by the claim. *In re Bond*, 910 F.2d 831, 15 USPQ2d 1566 (Fed. Cir. 1990).

The Reference

Niemela is a state of the art survey of embedded middleware. Embedded middleware is described by *Niemela* as a standardized object-oriented application interface for supporting distribution of networked embedded applications. *Niemela* discloses, *inter alia*, a background of heterogeneous client/server architectures as well as solutions applied for achieving interoperability.

The Examiner's argument is premised entirely on selected portions of Chapter 2 of *Niemela*. Chapter 2 describes architectures, distribution media, operating systems and software of heterogeneous networked systems. The entirety of the specific portions relied on by the Examiner are reproduced here for convenience:

The most common types of LANs and WANs are presented in Table 1. The Ethernet is widely used (75 % market share), but Fast Ethernet is growing rapidly. The use of ATM (Asynchronous Transfer Mode) is limited but growing, due to the increasing number of multimedia applications which require rapid data and video transfer. SMDS is used mostly in Europe as a precursor to ATM. SMDS supports variable-length packets that can be broken into ATM-size fixed cells in order to facilitate the transfer. Currently available SMDSs run at 45 Mbit/s. As for WANs in USA, Frame Relay is currently the most popular packet-switching technology. Frame Relay can route variable-length packets over existing routers at speeds between 1.54 / 20.4 Mbit/s. In addition, Frame Relay routes and assigns error checking to be executed by upper protocol layers (Orfali et al. 1996).

Currently, it would appear that ATM local area networks will be used only in special applications that require strict QoS management. ATM technology appears to be dominant in backbone networks, but in LANs, Gigabit Ethernet solutions will be dominant, owing to simpler implementation and greater cost effectiveness.

Page 18, Section 2.2.1

2.3.3.1 Windows 95 (Microsoft)

Pros:

OOUI, pug-and-play, hardware autodiscovery, network neighbourhood, remote registry editor, built-in SNMP agent, minimal TCP/IP stack, NetBEUI, IPX/SPX and PPP.

Page 24, Section 2.3.3.1

2.3.4.3 OS/2 Warp server (IBM)

Pros:

32-bit OS (including Lotus Notes and CORBA services, database, middleware, system management and communications offerings) is as well-equipped as its Unix counterparts, but easier to install, use, and manage. Fast file and print server, OOUI (installed with autodetecting hardware, configuration, and system management), disk mirroring, remote administration, remote software distribution, backup server, and software metering. Eagle: database, Lotus Notes, Internet commerce, TP Monitor, CORBA object services, DCE security and directory.

Page 27, Section 2.3.4.3

2.4.9 OPC

OPC (OLE for Process Control) was developed in order to satisfy the demand for integrating plant floor data into business systems. Plant floor devices and data have to be easily accessible instead of forming standalone "islands" without methods for distribution. What is required is a common way for applications to access data from any device on the plant floor, thereby creating a seamless data access in a manufacturing environment (OPC Taskforce 1996).

OLE for Process Control keeps hardware providers separate from software developers. It assigns data collection and distribution to one single developer. The developer provides software components for those devices which provide data to clients in a standard manner. Developers can write the software components in C and C++, and these components can be used by business application developers for example in Visual Basic without concern for the actual data access (OPC Taskforce 1996).

OPC is based on Microsoft's OLE/COM technology. The specification describes the OPC COM Objects and their interfaces which are implemented by OPC Servers. OPC Servers are provided by different vendors. The code written by the vendor determines the devices and data to which each server has access, the way in which data items are named and the details about how the server physically accesses that data (OPC Taskforce 1996).

Within each server, the client can define one or more OPC Groups. This provides a way for the clients to organise the data in which they are interested. Within each group, the client can similarly define one or more OPC Items which represent connections to data sources within the server (OPC Taskforce 1996).

OPC interfaces can be used at both the lowest and the highest level. On the lowest level, raw data from the physical devices can be transferred into a SCADA or DCS. On a higher level, data from the SCADA or DCS can be added into the application. OPC is a specification for two sets of interfaces: the OPC Custom interfaces and the OPC Automation interfaces. OPC Automation interfaces are generally used by programs created by some form of scripting language. OPC Custom interfaces are generally used in programs made by C++ to attain maximum performance (OPC Taskforce 1996).

OPC Server will generally be a local or a remote EXE including code that is responsible for data collection from a physical device (OPC Taskforce 1996).

Page 43, Section 2.4.9

Applicants' Response to the Examiner's Argument

Applicants submit that *Niemela* does not disclose "each and every element as set forth in the claim". Regarding claim 1, the Examiner cites to the first, third and fourth paragraphs of page 43 of *Niemela* for teaching a plurality of devices each having device configuration means for creating or updating device configuration data that includes a description of the device and a representation of interconnection and interaction of the

device with other ones of the plurality of devices. Respectfully, the cited portion of *Niemela* teaches no such thing.

The cited portion of *Niemela* (which is reproduced above) generally describes OPC (OLE for Process Control). More specifically, the cited portion (and in particular paragraph 3) describes that the OPC server code determines which devices and data each server has access to, and also describes the way in which data items are named and the details about how the OPC server physically accesses that data. In other words, this portion of *Niemela* describes how an OPC server accesses devices in a manufacturing environment. The Examiner, however, mistakenly reads this portion of *Niemela* to disclose attributes of *the manufacturing environment devices themselves*, as opposed to the OPC server that accesses the devices. When properly read, it should be clear that these portions of *Niemela* do not teach the recited plurality of devices each having configuration means for creating or updating device configuration data. On this basis alone, Applicants submit that the rejection is defective and should, therefore, be reversed.

In the advisory action mailed September 25, 2008 the Examiner response to the above argument as follows:

> "It is well known in the art of distributed control that OLE for Process Control is a common way for applications to access data from any device on the plant floor, thereby creating a seamless data access in a manufacturing environment." *Advisory Action*, Mailed September 25, 2008, Continuation Sheet.

Respectfully, the Examiner's response misses the point. Even assuming that OLE for process control is a common way for applications to access data from any device, that in no way teaches a plurality of devices each having device configuration means for creating or updating device configuration data that includes a description of the device and a representation of interconnection and interaction of the device with other ones of the plurality of devices. The fact that *Niemela* may disclose a way for applications to access data from devices on a plant floor says nothing about whether the devices have <u>configuration means for creating or updating device configuration data that includes a description of the device and a representation of interconnection and interaction of the</u>

device with other ones of the plurality of devices. Therefore, Applicants submit that the rejection is defective and should be reversed.

Further, even assuming that the cited portions of *Niemela* could somehow be read to describe a plurality of devices each having device configuration means for creating or updating device configuration data, the rejection is still defective for other reasons. Specifically, "device configuration data" is specifically recited in claim 1 as including a description of the device and a representation of interconnection and interaction of the device with other ones of the plurality of devices. In other words, the device configuration data associated with each device describes that device's relationship with other devices. The only relationship described in the cited portions of *Niemela* is between a device and an OPC server. Nothing is disclosed that corresponds to data providing a representation of interconnection and interaction between the devices in the manufacturing environment of *Niemela*.

In the advisory action mailed September 25, 2008 the Examiner response to the above argument as follows:

> "In addition to portions of the art presented in the previous office action, see Page 43 where *Niemela* discloses data from the physical devices can be transferred into a Supervisory Control and Data Acquisition or Distributed Control System; and OPC developed in order to satisfy the demand for integrating plant floor data into business systems." *Advisory Action*, Mailed September 25, 2008, Continuation Sheet.

Again, Applicants respectfully submit that the Examiner misses the point. Respectfully, the Examiner makes the unremarkable observation that data from the physical devices of *Niemela* can be transferred into a SCADA or Distributed Control System. However, this says nothing about the type of data or, more specifically, whether each of the physical devices have device configuration means for creating or updating device configuration data that includes a description of the respective device and a representation of interconnection and interaction of the device with other ones of the plurality of devices. Therefore, Applicants submit that the rejection is defective and should be reversed.

Further, *Niemela* does not disclose auto-discovery means for permitting a SCADA system to both self-configure itself relative to devices in an industrial equipment network, and to be updated relative to changes in the configuration of the industrial equipment, and associated devices or equipment therein, including discovering new or changed devices via communication of the device configuration data over said computer network. The Examiner argues that these limitations are disclosed by *Niemela* at page 24 and 27, last paragraph, and at page 43, third and fourth paragraphs.

As an initial matter, Applicants point out that these limitations refer to the "device configuration data" that was mischaracterized by the Examiner, as pointed out above. Accordingly, it follows that the Examiner's analysis here is rendered defective by virtue of the mischaracterization of "device configuration data". On this basis alone Applicants submit that the rejection is defective and should be reversed.

However, the rejection is defective for an entirely independent reason as well. Specifically, the teachings relating to "auto-detecting hardware" found on pages 24 and 27 have no apparent relationship to the description of OPC found on page 43 of *Niemela*. Nor has the Examiner even suggested a relationship, other than the fact that these descriptions are found in the same document. More specifically, nothing in the reference suggests that the auto-detecting hardware (from pages 24 and 27) is using any OPC-related data (from page 43) to perform the claimed auto-discovery, or even any kind of function for that matter. And certainly nothing in the casual reference to "auto-detecting hardware" suggests the use of "device configuration data" received from devices on a network, where the device configuration data describes both the sending device and its relationship to other devices in the network. Even assuming "auto-detecting hardware" suggests hardware capable of detecting another device connected to the hardware, that does not equate to receiving information that describes the detected device's interconnection and interaction with other devices.

In the advisory action mailed September 25, 2008 the Examiner response to the above argument as follows:

> "Page 24 and 27 of the prior art disclosing auto-detecting hardware as part of a Microsoft system, and Page 43 teaches Object Linking and Embedding for Process Control is [sic] based on Microsoft's OLE/COM technology; where OPC is responsible for data collection from a physical device developed in order to satisfy the demand for integrating plant for data into business systems." *Advisory Action*, Mailed September 25, 2008, Continuation Sheet.

Respectfully, the Examiner's remark in the Advisory Action is defective both because it mischaracterizes the reference and asserts a logically faulty premise. First, the portion of *Niemela* at page 27 that refers to auto detecting hardware is describing the OS/2 warp server from IBM, not a Microsoft system. Second, even assuming the auto detecting hardware were described with respect to a Microsoft system, it is simply untenable to suggest that a necessary relationship exists between products offered by a given company. In other words, the fact that OPC is based on Microsoft's OLE/COM technology does not necessarily require that all of Microsoft's operating systems support of OPC. Therefore, Applicants submit that the rejection is defective and should be reversed.

Regarding claim 7, the reference does not teach "configuring said plurality of pieces of industrial equipment and/or devices using a configuration tool included in each of said plurality of pieces of industrial equipment and/or devices, the configuration tool creating or updating device configuration data including description of the piece of industrial equipment and/or device and representation of the interconnection and interaction thereof with other ones of said plurality of pieces of industrial equipment and/or devices".

Nor does the reference teach "programming each controller for controlling and identifying its associated piece of industrial equipment and or device, and for sending the device configuration data both to the other ones of said plurality of pieces of industrial equipment and/or devices, and to said SCADA system over said data network".

For the teaching of these limitations, the Examiner again relies on pages 24, 27 and 43 of *Niemela*, i.e., the same portions of the reference relied upon for the rejection of claim 1. The mischaracterization of this disclosure of the reference and its

misapplication to respective claim limitations was described above with respect to claim 1. Applicants submit that the same analysis applies here, as far as a correct understanding of "device configuration data". Therefore, for the reasons given above with respect to claim 1, applicants submit that the rejection with respect to claim 7 is also defective and should be withdrawn.

The remaining claims are dependent from either claim 1 or claim 7, and therefore are also believed to be allowable.

CONCLUSION

The Examiner errs in finding that claims 1-10, 12 and 14-23 are anticipated by *Niemela* under 35 U.S.C. § 102(b).

Withdrawal of the rejections and allowance of all claims is respectfully requested.

Respectfully submitted, and
S-signed pursuant to 37 CFR 1.4,

/Gero G. McClellan, Reg. No. 44,227/

Gero G. McClellan
Registration No. 44,227
Patterson & Sheridan, L.L.P.
3040 Post Oak Blvd. Suite 1500
Houston, TX 77056
Telephone: (713) 623-4844
Facsimile: (713) 623-4846
Attorney for Appellant(s)

CLAIMS APPENDIX

1. (Previously Presented) In an industrial equipment network for interconnecting a plurality of devices, apparatus for permitting an associated SCADA system to be self-configuring, comprises:

a plurality of controllers dedicated to each one of said plurality of devices, respectively, for providing each with control and data functions for interacting with other of the devices in the equipment network, and other systems, wherein each one of said plurality of devices includes device configuration means for creating or updating device configuration data, the device configuration data including description of the device and representation of interconnection and interaction of the device with other ones of said plurality of devices;

a computer network;

means connected between said computer network and said plurality of controllers, respectively, for transferring data and/or control signals between individual ones of said plurality of controllers and said computer network at given times; and

auto-discovery means for permitting said SCADA system to both self-configure itself relative to devices in said industrial equipment network, and to be updated relative to changes in the configuration of said industrial equipment, and associated devices or equipment therein, including discovering new or changed devices via communication of the device configuration data_over said computer network.

2. (Original) The apparatus of claim 1, wherein said plurality of controllers are each provided by a programmable logic controller (PLC).

3. (Original) The apparatus of claim 1, wherein said transfer means is selected from the group consisting of a router, and switch.

4. (Original) The apparatus of claim 1, wherein said computer network consists of a local area network (LAN).

5. (Previously Presented) The apparatus of claim 1, wherein said auto-discovery means includes:

broadcast means for operating a controller of a given device, that has either changed its configuration or is new to said industrial equipment network, to broadcast over said computer network an auto-discovery protocol; and

server means included in said SCADA system responsive to an auto-discovery protocol from said given device, for requesting said controller of said given device for the device configuration data to permit said SCADA system to update its configuration for the given device itself and within the industrial equipment network.

6. (Previously Presented) The apparatus of claim 1, wherein said auto-discovery means includes:

server means included in said SCADA system and connected to said computer network, for in a first mode of operation periodically polling respective controllers of all of said plurality of devices in said industrial equipment network for any respective changes in configuration and identification of new ones of said plurality of devices, and in a second mode of operation individually requesting each responding one of said plurality of devices for the device configuration data to permit said SCADA system to update its configuration information.

7. (Previously Presented) A method for permitting a Supervisory Control and Data Acquisition system (SCADA) to automatically diagram the interconnection and interaction, and changes thereto, between a plurality of pieces of industrial equipment and/or a plurality of devices that may be connected to one another and to a data network, said method comprising:

configuring said plurality of pieces of industrial equipment and/or devices using a configuration tool included in each of said plurality of pieces of industrial equipment and/or devices, the configuration tool creating or updating device configuration data including description of the piece of industrial equipment and/or device and representation of the interconnection and interaction thereof with other ones of said

plurality of pieces of industrial equipment and/or devices:

establishing a network over which said plurality of pieces of industrial equipment and/or devices can selectively communicate with one another and with a SCADA system;

connecting different ones of said plurality of pieces of industrial equipment and/or devices each to either a common controller, or each to individual dedicated controllers, respectively, or each to a plurality of controllers, or some combination thereof; and

programming each controller for controlling and identifying its associated piece of industrial equipment and or device, and for sending the device configuration data both to the other ones of said plurality of pieces of industrial equipment and/or devices, and to said SCADA system over said data network.

8. (Previously Presented) The method of claim 7, further including the steps of:

assigning a unique IP address to each one of said plurality of pieces of industrial equipment and/or devices upon their request as they are connected to the network;

broadcasting onto the data network an auto-discovery protocol including the associated IP address from each piece of equipment or device when it is added to the network, or thereafter when a change is made to its interconnections and interaction with other of said plurality of pieces of equipment, and/or devices;

acknowledging via a server of said SCADA system the receipt of an auto-discovery request;

transferring to said server the device configuration data of the associated piece of equipment or device, to permit said SCADA system to configure monitoring;

operating said SCADA system to automatically monitor either by polling or receiving broadcasts from said piece of equipment or device; and

programming said SCADA system to automatically update and include the associated piece of equipment or device in a diagram identifying and showing each, and their interaction with other ones of said plurality of pieces of equipment and/or devices.

9. (Previously Presented) The method of claim 7, wherein an extensible

mark-up language (XML) is used to represent the device confiquration data.

10. (Previously Presented) The method of claim 7, further including the steps of:

assigning a unique IP address to each one of said plurality of pieces of industrial equipment and/or devices upon their request as they are connected to the network;

programming a server in said SCADA system to periodically poll said plurality of pieces of industrial equipment and/or devices;

operating a controller of each polled device or piece of industrial equipment to respond to a discovery request from said server by providing the device configuration data thereof; and

operating said server to use the device configuration data to configure monitoring of the associated device or piece of industrial equipment, whereafter device or equipment monitoring begins.

11. (Canceled)

12. (Previously Presented) The method of claim 7, further including the steps of:

configuring each dedicated controller for having its associated device or piece of industrial equipment interconnect and interact with selected other ones of said plurality of pieces of industrial equipment and/or devices;

operating each controller for connecting its associated device or piece of equipment to said network;

operating each controller and a server in said SCADA system for providing auto-discovery by the latter of each device and/or piece of equipment;

operating each controller to respond to a request from said server to provide the device configuration data of the associated device and/or piece of equipment;

operating said server, in response to the device configuration data to initially establish and thereafter update a database and a user interface of said SCADA system; and

operating said server to begin monitoring the associated device.

13. (Canceled)

14. (Original) The method of claim 12, further including in said step of operating each controller and a server in said SCADA system for providing auto-discovery, the steps of:

measuring the time for said server to respond to a controller of a device or piece of equipment awaiting a reply, and

indicating a network fault, and interrupting further SCADA system processing for the associated device or piece of equipment, if no reply is received within a predetermined period of time.

15. (Original) The method of claim 7, further including the steps of:

configuring each dedicated controller for having its associated device or piece of industrial equipment interconnect and interact with selected other ones of said plurality of pieces of industrial equipment and/or devices;

operating each controller for connecting its associated device or piece of equipment to said network;

operating each controller to request a reply from a respective controller of each selected one of other of said plurality of devices and/or pieces of equipment;

operating each controller to wait for a reply; and

operating a requesting controller in response to a reply from another controller to provide the latter with data for updating a database of its associated device or piece of equipment with identification and interconnection data associated with the device or piece of equipment of the requesting controller.

16. (Original) The method of claim 15, wherein said step of operating each controller to wait for a reply further includes the steps of:

measuring the time from making a request for reply to the receipt of a reply; and

indicating a network fault and interrupting further processing if no reply is received within a predetermined period of time.

17. (Original) The method of claim 12, further including the steps of:

operating each controller to request a reply from a respective controller of each selected one of other of said plurality of devices and/or pieces of equipment;

operating each controller to wait for a reply; and

operating a requesting controller in response to a reply from another controller to provide the latter with data for updating a database of its associated device or piece of equipment with identification and interconnection data associated with the device or piece of equipment of the requesting controller.

18. (Original) The method of claim 17, wherein said step of operating each controller to request contact from a respective controller of each one of said plurality of devices and/or pieces of equipment, further includes the steps of:

measuring the time from making a request for reply to the receipt of a reply; and

indicating a network fault and interrupting further processing if no reply is received within a predetermined period of time.

19. (Previously Presented) The method of claim 12, wherein said step of operating each controller and a server in said SCADA system for providing auto-discovery by the latter of each device and/or piece of equipment, further includes the steps of:

assigning a unique IP address to each one of said plurality of pieces of industrial equipment and/or devices upon their request as they are connected to the network;

broadcasting onto the data network an auto-discovery protocol including the associated IP address from each piece of equipment or device when it is added to the network, or thereafter when a change is made to its interconnections and interaction with other of said plurality of pieces of equipment, and/or devices;

acknowledging via a server of said SCADA system the receipt of an auto-discovery request;

requesting via said server the device configuration data of the associated piece of equipment or device, to permit said SCADA system to configure monitoring;

operating said SCADA system to automatically monitor said piece of equipment or device; and

programming said SCADA system to automatically update and include the associated piece of equipment or device in a diagram identifying and showing each, and their interaction with other ones of said plurality of pieces of equipment and/or devices.

20. (Previously Presented) The method of claim 12, wherein said step of operating each controller and a server in said SCADA system for providing auto-discovery by the latter of each device and/or piece of equipment, further includes the steps of:

assigning a unique IP address to each one of said plurality of pieces of industrial equipment and/or devices upon their request as they are connected to the network;

programming a server in said SCADA system to periodically broadcast a discovery request poll to said plurality of pieces of industrial equipment and/or devices;

operating a controller of each polled device or piece of industrial equipment to respond to a discovery request from said server by providing the device configuration data thereof; and

operating said server to use the device configuration data to configure monitoring of the associated device or piece of industrial equipment, whereafter device or equipment monitoring begins.

21. (Previously Presented) The apparatus of claim 1, wherein the device configuration means includes a configuration tool for allowing a user to enter operating parameters of the device, and creating a device-configuration file based on the operating parameters.

22. (Previously Presented) The apparatus of claim 21, wherein the device configuration file is organized as a hierarchy.

23. (Previously Presented) The apparatus of claim 1, wherein the plurality of controllers are configured such that the device configuration data, in its entirety, is communicated to said SCADA system while only relevant part of the device configuration data is communicated to other ones of said plurality of devices in the equipment network.

EVIDENCE APPENDIX

None.

RELATED PROCEEDINGS APPENDIX

None.